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It was the purpose of this study to determine the type and amount of nutrition education received by selected primigravidas from their obstetricians and from other sources, to investigate the attitudes of the pregnant women and their doctors toward nutrition, and to determine the knowledge of the women about selected aspects of maternal nutrition.

The subjects were thirty women in the sixth to eighth month of their first pregnancies who were patients of seven obstetricians in two group practices in Greensboro, North Carolina. The obstetricians also participated in the study. One nurse from each obstetrical group selected the patients to participate in the study.

The data were collected using four instruments devised by the researcher. These were: 1) Women's Attitude Scale, 2) Nutrition Knowledge Quiz, 3) Women's Interview Schedule, and 4) Obstetricians' Questionnaire.

Results indicated that 56% of the women felt that the nutrition information they had received during pregnancy had caused them to improve their eating habits. Sixty percent of the women, however, felt that most pregnant women do not have a good knowledge of nutrition. Scores on the nutrition knowledge quiz were low. The women seemed familiar with good protein and Vitamin C sources. The obstetricians'

questionnaires indicated that the doctors felt that good nutrition during pregnancy is important, and all of them indicated that they gave nutrition information to their patients. The quantity and the quality of the information given, however was not adequate.

The study indicates a definite need for more intensive nutrition counseling during pregnancy, particularly in basic nutrition. Since this counseling probably cannot be done by the obstetrician because of time limitations or lack of knowledge in the area, nutrition professionals should be utilized to fill the need. A nutritionist will be able to give information to patients with special problems, as well as those who need only general information.

THE SCOPE OF NUTRITION EDUCATION RECEIVED BY
SELECTED PRIMIGRAVIDAS WITH EMPHASIS
ON THE ROLE OF THEIR OBSTETRICIANS

by

Linda Rallings Barker

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Greensboro
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March 31, 1976
Date of Acceptance by Committee

Approved by

Carol J. Fritz
Thesis Adviser

APPROVAL PAGE

This thesis has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

Thesis Adviser

Carol J. Fritz

Committee Members

Barbara Clawson

Margaret H. Klemmer

Allen C. Magee

March 31, 1976

Date of Acceptance by Committee

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Thanks are extended to the obstetricians and their patients, without whose participation this study would not have been possible. The author also wishes to thank the two nurses who selected the women to be interviewed for the study.

Special recognition goes to the author's parents, Dr. and Mrs. Elisha M. Rallings, for their love and reassurance given freely, and for their willingness to help in any way possible.

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effect on the outcome of pregnancy. In the last thirty years, studies have shown that the pre-pregnancy and prenatal nutrition of the mother, as well as weight gain during pregnancy, influences the status of the infant at birth.

Since nutrition does play an important role in the outcome of pregnancy, education concerning nutrition is highly important. Education should begin early in life and continue as a habit with the prospective mother entering pregnancy in the best nutritional condition possible. However, even if the woman enters pregnancy in a good nutritional state, proper counseling during pregnancy is still of value. Prenatal nutrition should be maintained as long as possible. Prenatal nutrition is a habit that should be maintained throughout the pregnancy.

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CHAPTER I

INTRODUCTION

Since the beginning of recorded history, pregnant women and their diets have received special attention. Many diets were based on tradition or on folklore. As modern medicine evolved, research studies were undertaken to determine whether or not nutrition during pregnancy had any effect on the outcome of pregnancy. In the last thirty years, studies have shown that the prepregnancy and prenatal nutrition of the mother, as well as weight gain during pregnancy can influence the status of the infant at birth (1).

Since nutrition does play an important role in the outcome of pregnancy, education concerning nutrition is vitally important. Preferably this education should begin early in life and continue to adulthood with the prospective mother entering pregnancy in the best nutritional condition possible. However, even if the woman enters pregnancy in a poor nutritional state, proper counseling may help to change eating habits during pregnancy, which in turn may help to assure that good nutrition will continue into any future pregnancies.

Most pregnant women rely on their obstetricians for nutrition information. Many doctors, however, have received

very little training in nutrition (1,2), and cannot give accurate or adequate information. In these situations, other professionals trained in nutrition may supplement the advice of the doctor. Since pregnant women are usually very receptive to information because they are concerned about the health of their unborn children, this opportunity to teach proper nutrition habits should be utilized to the fullest. This teaching may have far-reaching effects on entire families.

Because of this, it is of interest to know the type and amount of nutrition information that pregnant women are receiving from their doctors. The present study was undertaken to 1) determine the type and amount of nutrition education received by selected primigravidas in Greensboro, North Carolina, from their obstetricians, 2) investigate the attitudes of the women and the doctors toward nutrition, and 3) investigate the knowledge of the women regarding selected aspects of maternal nutrition.

CHAPTER II

REVIEW OF LITERATURE

The relationship of nutrition to pregnancy outcome has long been an area of interest to researchers. Numerous studies have been undertaken in an effort to determine the effect of the mother's diet on her offspring.

Early animal studies by Warkany (3) indicated that maternal dietary deficiencies can cause congenital malformations in offspring. It is more difficult to study maternal-fetal nutritional relationships in humans than in animals because of the ethical problems which prohibit drastic dietary deprivations in humans. Certain hypotheses can be tested, however, when deprivation does occur in situations such as war time or famine.

Smith (4) reported evidence that children born in Holland in 1944-45 during the blockade of food supplies were shorter in length and had a lower average birthweight than those infants born in previous years. The incidence of stillbirth, prematurity, and deformity, however, did not increase significantly. Smith postulated that since prewar nutrition had been good, the nutritional reserves of the mothers provided for many of the demands of pregnancy.

In a similar study concerning children born during the seige of Leningrad (5), poor nutrition for years preceding

the seige followed by acute nutritional deprivation of the mothers resulted in disastrous pregnancy outcomes. The stillbirth rate reached twice its normal level, while the average birthweight fell 500 to 600 grams. Mortality rates rose for full-term and premature infants.

Other studies done in the forties and fifties have contributed both positive and negative information on the effect of nutrition during pregnancy on the infant. The classic studies of Burke (6,7) compared the nutrition status of the mother during pregnancy with the physical condition of the infant at birth and during the first two weeks of life. The mothers were divided into four groups of dietary ratings (good, fair, poor, and very poor) according to information from diet histories obtained at the time of the mothers' initial visits and at subsequent visits during each trimester. The infants were rated according to their condition at birth (excellent, good, fair, or poorest) by obstetricians and pediatricians. Results showed that all stillbirths, most neonatal deaths and premature births, and most congenital defects occurred in infants born to mothers whose diets were poor or very poor. Burke, concluded, therefore, that a significant relationship does exist between a mother's nutrition and her pregnancy outcome.

Ebbs (8) in a study of 400 pregnant women on poor diets, supplemented poor diets, and good diets during pregnancy concluded that mothers on good diets had fewer

complications and were better obstetrical risks. In the women on poor diets, the incidence of miscarriage, stillbirths, and premature births was increased.

Jeans, Smith and Stern (9) evaluated the nutritional status of 404 pregnant women and, after their infants were born, concluded that as the nutritional status decreased, the incidence of prematurity rose. Also, the lowest birth weight, the lowest vitality, and the largest number of deaths in the newborn period occurred among infants born to the most poorly nourished mothers.

The Vanderbilt Study of Maternal and Infant Nutrition (10,11) was a study of 2,046 white women who received prenatal care at Vanderbilt University Hospital between September, 1945, and December, 1950. Nutritional evaluations of the women were made once each trimester and no attempts were made to change the diets of the subjects. The researchers were unable to prove that nutrition was a major causative factor in the development of any common obstetric or fetal abnormalities.

Bagchi and Bose (12) compared the offspring of 150 women of low economic status and restricted nutrient intake with the offspring of fifty high economic level subjects on adequate diets. The researchers could find no significant difference in the offspring of the two groups. They theorized that this might be because the women on the deficient diets had been accustomed to them all their lives and were able, in some manner, to economize on available nutrients.

The weight of the woman prior to pregnancy and its effect on the infant have also been studied. Simpson (13) in a study at Brooke General Hospital concluded that as the prepregnancy weight gain increased, there was a decline in low birthweight babies. Low birthweight had been associated with a high mortality rate, poor development and growth, and intellectual slowness. Niswander (14) found similar results in a study in which a strong negative association was found between high prepregnancy weight and risk of low birthweight infants.

Mayer (15) has theorized that the great variation in mothers' diets with no visible impairment in the babies may be due to not dealing with the patients at comparable levels of nutrition. Also, the nutritional past of the mother may greatly influence her pregnancy outcome.

Since nutrition appears to be a very important determinant in pregnancy outcome, the nutrition education of the prospective mother must be insured. Several different theories for education have been expressed. Lund (16) stated that each patient should be considered as an individual and should not be treated according to standards for any person or group of persons. He recommended that a dietary history be taken, and the basic diet during pregnancy along with any modifications be explained either by the physician or other qualified individual.

Jacobsen (17) and Carter (18) felt that the nurse could and should play an important role in disseminating nutrition education during pregnancy. Carter felt that the nurse had more and better opportunities for communicating with the woman than did the physician, and might understand her situation better. Jacobsen recommended that the nurse play the most important role, with the physician becoming involved only in special cases, such as toxemia or diabetes. The dietitian would act as a consultant to the nurse or the doctor, and might work directly with patients who had special difficulties.

Lowenburg (19) felt that the nutritionist should counsel women concerning planning and preparing meals, since she is a specialist in this area. The nutritionist should also keep the doctor and nurse informed about any current research.

Mayer and Dwyer (20) wrote that private patients receive even less nutritional advice than clinic patients, who may have access to a nutritionist. They suggest the use of dietitians by private physicians and the accurate and early detection of dietary problems to remedy this situation. They also recommend dividing patients into three groups; those on therapeutic diets, those who need nutritional counseling (adolescents, unusual eating habits, indigents, etc.) and those without recognized problems, so that it will be easy to know those who need the most extensive counseling.

Some educators feel that nutrition education during pregnancy itself is not enough. Gold (21) advocated "inter-conceptual nutrition" which calls for nutrition education and periodic health examinations throughout the life cycle. He believed that a well-fed child will become a well-fed adult, and will be a physiologically efficient parent.

If women are to be educated about nutrition by their physicians, the doctors must be knowledgeable on this important topic. Most medical schools, however, do not give sufficient training in nutrition (1,2). Newton, in a statement prepared for the Committee on Maternal Nutrition, recommends that:

Instruction in the science of nutrition should begin early in medical school, and instruction in the practical application of the science should continue through the clinical years. Particular attention should be paid to it in obstetrics and gynecology because of the far-reaching implications for the family. If this is done, the practicing obstetrician will have a good working knowledge of nutrition and will be familiar with useful publications on the subject. He will be able to cooperate with and use the advice of experts in nutrition. Further, he will be able to instruct members of his staff who give nutritional advice to patients.

Studies relating to the actual type of nutrition education which obstetricians give their patients are very few. Donabedian (22) in 1961, published a study concerning factors influencing prenatal care. One part of the study inquired into the instruction the subjects received relating to food and to weight gain. It also touched on sources of information regarding diet, reading material on nutrition

recommended by the doctors and reading undertaken on the patient's own initiative. Maternal instruction was rated good for primigravidas, but multigravidas did not receive equivalent instruction. A need for studies similar to those of Donabedian and others relating to the best received and utilized nutrition information are indicated.

CHAPTER III

METHODOLOGY

This study concerning nutrition education during pregnancy was conducted to answer four questions related to prenatal nutrition care:

1. What is the attitude of women in first pregnancies toward nutrition?
2. How much actual knowledge do the women have regarding aspects of nutrition which are important to their pregnancies?
3. What are some of the attitudes of obstetricians about nutrition during pregnancy?
4. What kind and how much nutrition information are the women receiving from their obstetricians and from other sources?

The women selected for the study were primigravidas who were patients of seven obstetricians in two private group practices in Greensboro, North Carolina. Most of the subjects were in their mid to late twenties and fell into a middle economic group. A nurse from each group practice selected the subjects, basing their selection on the following criteria:

- a. that the women be in the sixth to eighth month of their first pregnancies, as determined by the expected date of confinement;

b. that the women had at least three previous office visits prior to being interviewed for the study;

c. that the women have no preexisting physiologically stressful conditions, such as diabetes or toxemia.

A sample size of approximately thirty was considered adequate and it was estimated that a sample of this size could be easily secured from two group practices. Recommendations were obtained from the University of North Carolina at Greensboro School of Nursing as to which group practices would be most willing to cooperate in the study. Two of the recommended groups were contacted and agreed to participate. Seven doctors comprised the two groups. Five of the obstetricians responded to the mailed questionnaire; three immediately, and two after a follow-up mailing.

The research instruments used for the pregnant women in the study included a nutrition knowledge quiz of twelve items, an attitude scale of fifteen items, and a ten question interview schedule. The doctors' attitudes and practices were assessed by a twelve item questionnaire.

All of the research instruments were devised by the researcher after careful perusal of the literature (1,18,23, 24) and consultation with knowledgeable sources. They were reviewed by an expert panel of three members. The instruments are included in Appendices A-D.

The offices of the obstetrical practices were selected as the best location for the patient interviews for several reasons:

a. The patients could be interviewed at their regular appointment times, thus saving them the inconvenience of appearing at another time and place.

b. The researcher would be able to interview many patients in succession.

c. The prospective mothers might be more willing to participate if they understood that their doctors had allowed their offices to be utilized for interviewing purposes.

The attitude scale was the first of the three instruments to which the women were asked to respond. This was to insure that their answers would not be biased by questions used in the other instruments. The nutrition quiz was administered second, and the women were interviewed about nutrition education last. The doctors' questionnaires were sent out prior to interviewing the women.

The findings of the study were tabulated according to the following scheme:

a. A comparison was made of the answers of the women and the obstetricians regarding the amount and type of nutrition education that was given and received.

b. Attitude scale scores were quantified for each item.

c. Individual nutrition knowledge scores were recorded as the percentage correct out of a possible one hundred percent. The total number of women answering each question correctly or incorrectly was tallied. Also,

questions were noted which were most often answered correctly or incorrectly.

CHAPTER IV

RESULTS

Four instruments were developed in order to determine the type and amount of nutrition education received by selected primigravidae from their obstetricians, to investigate the attitudes of the women and the doctors toward nutrition, and to investigate the knowledge of the women regarding selected aspects of maternal nutrition. This section will discuss the results obtained from each instrument in the following order: 1) attitude scales completed by the women; 2) nutrition knowledge quiz completed by the women; 3) obstetricians' questionnaires and women's interviews concerning nutrition education.

Attitude Scale

Table I displays the data collected from the attitude scales. These data have been combined for the two group practices because of the similarity of results. The results of the individual practices may be referred to in Appendices E and F.

In this discussion, items have been grouped in descending order by the percentage of the responses they received, whether it be in agreement or disagreement. The four following statements were disagreed with by 89 percent or more of the total population.

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TABLE 1

WOMEN'S ATTITUDE SCALE RESPONSES
GROUPS I AND II

Item	SA		A		U		D		SD		NA	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1. Pregnancy weight gain*	3	10	1	3	2	7	10	30	14	47	0	0
2. Eat for two	0	0	0	0	3	10	13	42	14	47	0	0
3. Vitamin usage*	0	0	0	0	0	0	15	50	15	50	0	0
4. Instinctive eating	0	0	7	23	4	13	14	47	3	10	2	7
5. Milk consumed*	0	0	0	0	2	7	18	60	10	33	0	0
6. Concern with eating	6	20	18	60	3	10	2	7	1	3	0	0
7. Prior food habits	2	7	12	39	9	30	4	13	2	7	1	3

* Negative Statement

SA Strongly Agree

A Agree

U Uncertain

D Disagree

SD Strongly Disagree

TABLE 1--Continued

Item	SA		A		U		D		SD		A	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
8. Worry about food*	0	0	2	7	1	3	16	53	11	36	0	0
9. Nutrition knowledge	1	3	5	17	6	20	14	47	4	13	0	0
10. Practice good habits	1	3	10	33	6	20	12	39	1	3	0	0
11. Cravings for food	0	0	7	23	5	17	13	42	6	17	0	0
12. Foods to eat or avoid	2	7	19	63	3	10	6	20	0	0	0	0
13. Learning nutrient content*	1	3	2	7	4	13	19	63	2	7	2	7
14. Obtain nutrition knowledge	3	10	19	63	2	7	4	13	0	0	2	7
15. Avoid salt	3	10	13	42	6	20	6	20	0	0	0	0

* Negative Statement

A. As long as a pregnant woman takes vitamins every-day, it does not really matter what food she eats.

B. It is not important for a pregnant woman to drink a lot of milk unless she is planning to breast-feed her child.

C. When a woman is pregnant, she must eat twice as much as she normally would because she is "eating for two."

D. During pregnancy, a woman has enough to think about without worrying about the food she eats.

In other words, the women apparently believe that during pregnancy they do not have to eat twice as much as they normally would. They realize that they must give some thought to planning to their diets, and that a multivitamin supplement does not insure dietary adequacy. Milk was recognized as an important component of the diet, even if one is not planning to breast-feed. The fact that 89 percent or more of all the women interviewed disagreed with these four statements would seem to suggest that the women are aware, at least to some extent, of the importance of nutrition to their pregnancies.

The next two statements also seem to attest to this awareness. Eighty percent of the women agreed that a pregnant woman will usually be more concerned about her eating habits than a non-pregnant woman. This might imply that the state of pregnancy itself impressed on these women the importance of good nutrition. The women were aware that the amount of weight gained during pregnancy is important; as evidenced by

the fact that 77 percent of them disagreed that the amount of weight a woman gains during pregnancy is not important.

The next statements related to availability and type of nutrition education. Seventy-three percent of the population thought that it was easy to obtain accurate nutrition information during pregnancy. Seventy percent felt that the best type of information to receive was lists of foods to eat and foods to avoid, but an equal number felt that memorizing the nutrient contents of foods would not be useless.

A lower percentage of the women, 60 percent, disagreed that most pregnant women have a good knowledge of nutrition. This is interesting since 73 percent thought that accurate nutrition knowledge was easy to obtain.

Fifty-seven to 59 percent of the subjects disagreed that cravings for food during pregnancy are the body's way of telling a woman that she is deficient in some nutrient, and that a woman will act instinctively during pregnancy to eat the foods she needs. These responses relate a similar idea, that instinct and cravings will not help the pregnant woman to maintain good nutrition.

The final three statements did not receive as clear a response:

A. A woman's food habits prior to pregnancy can influence the development of her child.

B. Pregnant women usually practice good eating habits.

C. Salt should be avoided during the last three months of pregnancy.

The first statement relates the importance of good nutrition throughout the life cycle with a favorable pregnancy outcome. Forty percent of the women did agree with the statement, but 30 percent were undecided. A definite need exists for nutrition education in this area.

Regarding the practicing of good eating habits, only 36 percent of the women thought that pregnant women did so, while 43 percent disagreed. Twenty percent of the women were undecided. As mentioned previously, 73 percent of the women thought that they could easily obtain accurate nutrition information, while 60 percent felt that pregnant women did not have a good knowledge of nutrition. Perhaps it is difficult to know if one is practicing good nutrition if one does not know the meaning of good nutrition.

The statement concerning the restriction of salt during pregnancy also drew a wide range of answers. Fifty-two percent felt that salt restriction was necessary in the last trimester, with 20 percent disagreeing and 20 percent undecided. These figures may reflect to a great extent the attitude of the obstetricians rather than that of the women, since it has long been popular for obstetricians to restrict salt routinely.

Summary

Generally, the women interviewed in this study realized the importance of many aspects of nutrition. They felt that milk should be a part of the diet, even if one is not planning to breast-feed; that a pregnant woman does not have to eat for two; and that taking vitamin supplements does not insure dietary adequacy. They also thought that pregnant women should think about and plan their diets. Sixty percent felt that most pregnant women did not have a good knowledge of nutrition even though 73 percent felt that nutrition information was easy to obtain. About one-half of the women thought that cravings and instinct would not help a woman in selecting the correct foods for her diet. They seemed undecided about the influence of nutrition prior to pregnancy on the development of the child. Several of the answers could have been influenced by the opinions of their doctors, such as salt restriction during the last trimester of pregnancy. Overall, the women seemed to feel that nutrition was important in pregnancy, even though they did not know enough about the subject.

Nutrition Knowledge Quiz

The data relating to the nutrition quiz taken by the women in the two group practices appears in Table II. Each paper was graded and the score was expressed as a percentage correct out of a possible 100 percent. The scores ranged

TABLE 2
NUMBER AND PERCENTAGE OF RESPONSES TO THE
NUTRITION KNOWLEDGE ITEMS
GROUPS I AND II

Item	Correct		Partially Correct		Incorrect	
	No.	%	No.	%	No.	%
1. Best weight gain	9	30	0	0	20	67
2. Timing of weight gain	7	23	0	0	23	77
3. Poor sources of iron	2	7	24	80	4	13
4. Daily milk usage	14	47	0	0	6	20
5. Other calcium sources	11	37	8	27	11	37
6. Good protein sources	5	17	23	77	2	7
7. Vitamin D sources	14	47	1	3	15	50
8. Thiamin sources	14	47	1	3	15	50
9. Vitamin A sources	9	30	0	0	21	70
10. Vitamin C sources	22	73	0	0	8	27
11. Highest caloric content--No. 1	5	17	0	0	25	83
12. Highest caloric content--No. 2	9	30	0	0	21	70

from 12 percent to 89 percent, with the highest score belonging to a graduate student studying nutrition. On the whole, the two groups of women answered in a similar manner. Any differences which did occur will be pointed out. The numbered paragraphs refer to the questions being discussed. The quiz may be referred to in Appendix A.

1. The best amount of weight to gain during pregnancy is twenty to twenty-five pounds. Thirty percent of the sample answered this question correctly. The incorrect answer given most often was fifteen to twenty pounds, which could have been the result of the opinions of the women's obstetricians, since many think that a lower weight gain is best.

2. Most of the weight gain during pregnancy should occur in the last six months. Fifteen percent of Group I and 40 percent of Group II chose this answer. The majority of the women answered that most of the weight gain should occur in the last trimester.

3. Although most of the women did not give a totally correct response regarding iron containing foods, 80 percent or more did give partially correct responses. Twenty of the thirty women (or two-thirds) knew that potatoes, squash, and corn were not good sources of iron; and fourteen answered that pineapples, oranges, and bananas were not. Only four of the thirty women knew that milk and cheese were not. All knew that spinach and mustard greens were good sources of iron.

4. A pregnant woman should consume three to four cups of milk a day. About 50 percent of both groups did select this answer. Two to three and four to five cups were also chosen frequently. Perhaps the overlap in numbers was confusing, or the advice of the obstetricians could have influenced these answers.

5. Of the items listed, green leafy vegetables are the best sources of calcium. The responses of the groups differed on this question. In Group II, 60 percent of the women answered correctly. However, only 30 percent of Group I were correct. The incorrect answer chosen most often was enriched breads and cereals. Six of the women thought fruits were a good source and only one individual selected fats. The results of the question might indicate the greater emphasis which is placed on milk as a good source of calcium, as opposed to other foods.

6. Question six asked the women to choose from a list of eight those foods which are good protein sources. Once again, the majority of the subjects were not totally correct or totally incorrect. Eighty percent of Group I and 70 percent of Group II gave partially correct responses. Twenty-one of the thirty women correctly identified beef as a good protein source and twenty-three correctly selected milk. Dried beans, the other correct answer, was selected by only seven subjects. None of the incorrect answers received a significant number of responses. These answers show that these women have some knowledge of protein sources.

7-10. Questions seven to ten were a matching exercise to determine if the subjects could identify those foods which are the best sources of four vitamins important in the diet of a pregnant woman. The women seemed to have guessed the answers to question seven which gave the sources of thiamin (Vitamin B₁), and question eight which referred to the sources of Vitamin D. Approximately equal numbers of women in each group answered correctly and incorrectly. Question nine which gave the best sources of Vitamin A was missed by 80 percent of Group I and 50 percent of Group II. Of the total groups, twenty-one out of thirty women answered incorrectly. The best sources of Vitamin C (question ten) were recognized by more of the women than any other vitamin. Eighty percent of Group I and 60 percent of Group II answered this question correctly.

11-12. Regarding the caloric value of food in question eleven, twenty of the thirty women chose one half cup of mashed potatoes as having the highest caloric value. Only four correctly chose the one half cup of cooked prunes. The hotdog was most often selected as having the highest caloric content in question twelve, although eight persons correctly chose the three ounces of roast beef. The percent of incorrectness on these two questions ranged from 70 to 83 percent.

Summary

In summary, the women appeared to be familiar with good sources of protein and Vitamin C. They also seemed to be aware of foods which were good iron sources, except for milk and cheese, which they incorrectly thought were good sources. Only thirty percent of the women knew the best amount of weight to gain during pregnancy, and the majority of the women thought that most of the weight gain should take place in the last trimester. Both of these answers probably reflected the obstetricians' opinions on these issues. About fifty percent of the groups knew that pregnant women should drink three to four cups of milk daily and that green, leafy vegetables are also a good calcium source. The women had difficulty identifying sources of Vitamins A, D, and thiamin (B_1), and they also did not seem to be knowledgeable concerning caloric content of commonly eaten foods.

Obstetricians' Questionnaires and Women's Interviews

The obstetrician's questionnaire and the women's interview schedule were designed to determine the type and amount of information concerning nutrition in pregnancy which the doctors gave and the women received. Certain attitudes of the obstetricians about nutrition may also be ascertained from their questionnaires. Copies of the two instruments may be reviewed in Appendices C and D.

Information from Doctors' Questionnaires

All of the five doctors responding to the questionnaires indicated that they gave routine dietary information to all patients. This information was both verbal and written. When asked to describe the contents of the information briefly, answers given were:

a) Verbal information is given to each patient on her initial visit as to what is expected. She is told to read information distributed.

b) Patients are given prenatal literature with dietary information included. General instructions are given to include protein.

c) A high protein, good calcium, and moderate carbohydrate diet is discussed.

d) On the initial visit, the importance of nutrition, eating habits, and dietary alterations such as high protein intake and vitamin supplements are discussed.

e) No answer.

None of the respondents requested a diet history from their patients. All said that they routinely distributed printed material about nutrition. However, none described the material.

Nutrition education by the obstetricians was given mostly on the initial visit by four of the doctors. Two said that they gave it as was necessary during pregnancy. All said that they discussed nutritional preparation for lactation with their patients, but none said when this occurred.

Tests which the doctors said they utilized for evaluating nutritional status varied. One answered that an SMA-12¹ was used routinely, and another said it was used occasionally. Three measured hematocrit levels and one included weight, blood pressure and urinalysis.

All five doctors routinely prescribed a vitamin supplement, four with a mineral mix for all patients and one with iron for about half the patients. One doctor prescribed calcium salts routinely and two occasionally.

All five doctors told patients specific foods to include (Table 3) and three listed foods to avoid.

TABLE 3
FOOD GROUPS RECOMMENDED BY OBSTETRICIANS

Food Group	Number Recommending
Milk and Dairy Products	4
Meats	5
Fruits and Vegetables	3
Bread and Cereals	1

¹A broad profile blood chemistry analysis to measure circulating levels of various nutrients and their metabolites and selected enzymes.

Foods which the doctors told their patients to avoid included sweets (2), fried foods (2), snack foods (3), and white vegetables (1).

Three obstetricians did not change their nutrition instruction as pregnancy progressed. One said he advocated low salt diets in the third trimester, and one remarked that when complications such as indigestion, constipation, or fluid retention occur in the third trimester, different information is provided.

The doctors were asked to rank the following five items in terms of their importance during pregnancy: 1) planned exercise program; 2) adequate rest; 3) proper nutrition; 4) appropriate weight gain; and 5) prenatal examinations begun early in pregnancy. One doctor said that all items were equally important. Two rated nutrition as most important, while the other two thought that nutrition was not as important as prenatal examinations begun early in pregnancy.

Four of the doctors felt they should give nutrition information to patients. Other individuals that they thought should also give information were nurses, parent educators, nutritionists, paramedical personnel, and other staff members.

Information from Women's Interviews

Sixteen of the thirty women in the study had been questioned about their eating habits. Twenty-six had

received nutrition information from the obstetrician or his staff. Both verbal (18 women) and written (24 women) information was given.

Seventeen replied that they had been instructed to include certain foods in their diets. When the foods they mentioned were divided into the four food groups (Table 4), three groups (milk and dairy products, fruits and vegetables, meats) had been suggested many times, however, the bread and cereal group was included only once.

TABLE 4
FOOD GROUPS RECOMMENDED BY OBSTETRICIANS
AS REPORTED BY THE WOMEN

Food Group	Group I	Group II	Total
Milk and Dairy Products	7	5	12
Meats	9	1	10
Fruits and Vegetables	5	7	12
Breads and Cereals	0	1	1

Foods which the women were instructed to avoid included sweets (cakes, pies, candy, ice cream, carbonated drinks), starchy foods (french fries, potato chips, noodles, spaghetti, bread), and salty foods.

The majority of the women said that they received nutrition education primarily on one office visit, and usually in early rather than late pregnancy.

Sixteen women reported that home economics and health classes were their primary nutrition sources prior to pregnancy. Four subjects had taken nutrition courses. Nineteen of the women had read some printed material about nutrition with popular magazine articles the most frequently reported source. One woman had read Let's Have Healthy Children by Adelle Davis.² The women went to many sources during pregnancy for information about nutrition. Books, magazines, and pamphlets were cited as being most helpful by one group, while the other group said that their doctors were most helpful. Of the total sample, one third thought that reading materials were most helpful (Table 5).

TABLE 5
MOST HELPFUL NUTRITION INFORMATION SOURCES

Source	Group I	Group II	Total
Books, Magazines Pamphlets	7	3	10
Obstetrician	3	4	7
Friends or Relatives	3	1	4
Other	5	0	5
No Answer			

²Adelle Davis was a popular writer, but not recognized as a nutrition authority by associations of professional nutritionists.

Only four of the women said that they had questions about nutrition which had not been answered. These were:

- 1) Does lack of calcium in the diet cause leg cramps?
- 2) What foods should be eaten every day?
- 3) What foods should be eaten and which should be avoided?
- 4) Need more information about what foods to eat.

Twenty-one women said that the information they had received had changed their eating habits. Seventeen felt that their habits had improved. Of those who said no change had occurred, most stated that they had already had good eating habits.

Only four of the women said that they had received nutritional preparation for lactation from their obstetrician or a staff member. The information had been given to those four at different times during pregnancy.

Summary

The doctor's questionnaires revealed that all gave some verbal and written information concerning nutrition to their patients. Most of the information given took place early in pregnancy and usually consisted of foods to include in or delete from the diet. The women's answers agreed with these. The women's interviews showed that almost 100 percent had received some instruction in nutrition from their obstetrician. Foods which the doctors advised the women to

include in their diets included some from all four food groups, but with only one mention of bread and cereals.

All doctors said that they discussed nutritional preparation for lactation with their patients. However, only four women reported being advised on this subject.

Vitamin and iron supplements were generally prescribed by the obstetricians for almost all patients. Tests for evaluating nutritional status of patients were usually hematocrit determinations or more sophisticated blood tests.

Sources of nutrition information which were most helpful to the women were reading materials (books, magazines, and pamphlets) and their obstetricians.

Twenty-five of the subjects said that the information they had received during pregnancy had changed their eating habits, and only five had any questions about nutrition which had not been answered.

CHAPTER V

DISCUSSION

This study was conducted to answer four questions concerning nutrition education during pregnancy.

1. What is the attitude of women in first pregnancies toward nutrition?

The attitude scale used in the study showed that the women were familiar with some basic concepts of nutrition which are important to pregnancy, such as the importance of drinking milk and the need for planning the diet. They also felt that women should eat foods from all groups even if they are taking vitamin supplements. They realized that "eating for two" is not necessary.

Several of these attitudes could have been influenced by the advice the women had received from their obstetricians, particularly the inclusion of milk in the diet and the restriction of weight (do not eat for two). The women were advised to be selective in their diets, even if vitamin supplements were being taken. The importance of milk in the diet could also have been impressed on the women by advertisements, like those which advocate milk as "nature's most perfect food."

It is interesting to note that 60 percent of the subjects felt that women did not have a good knowledge of

nutrition, although 73 percent felt that nutrition knowledge was easy to obtain. This indicated that there is some discrepancy between the ease with which information can be obtained and learning how to use it. If a woman received dietary information which she was unable to use either because of her economic situation, ethnic background, or lack of knowledge concerning food preparation, it would be necessary for someone knowledgeable in nutrition and food preparation to fit the instructions to the lifestyle of the patient.

Other causes of interference with utilizing information given are the nausea, vomiting and anorexia which are common in early pregnancy, or the fear of gaining too much weight (23). Even if motivation is great, as it often is in pregnancy, these problems can keep a woman from attaining optimal nutrition.

Motivation is one key to improving the eating habits of the pregnant woman. However, since interference can occur, there should be greater emphasis placed on the establishment of long-term good food habits. Nutrition education must begin long before pregnancy occurs.

Seventy percent of the women felt that lists of foods to eat and foods to avoid would be the best type of information to receive. However, Krause (24) in a discussion of nutrition education during pregnancy, stated that printed diet lists are of little or no value unless they are accompanied by a complete explanation of how foods in the list can

be utilized in the existing diet of the mother and her family. Once again, the importance of counseling by a nutritionist or dietitian is indicated.

Seventy percent of the women also thought that memorizing the nutrient content of foods can be helpful. They could have been thinking that this information would not only be helpful during pregnancy, but also could be remembered and applied after pregnancy.

About 50 percent of the subjects held the attitude that instincts and cravings for foods during pregnancy would help them to meet their nutritional needs. This is another "old wives' tale" which should be discredited. However, this one has been widely publicized in mass media, particularly in advertising, which causes many people to believe that it is true.

The women were undecided as to whether pregnant women usually practice good eating habits. This might be due to lack of knowing what constitutes good nutrition. The keeping of some dietary records during pregnancy would allow the women to evaluate their diets to see if they are adequate.

The women were undecided as to their attitudes on two topics: 1) the food habits of the mother prior to pregnancy influencing the development of her child, and 2) salt restriction during the last trimester of pregnancy. Although much research has been done on these subjects, the technical nature of the studies seemed to preclude the women in this study from being knowledgeable about them.

In regard to the food habits of the mother, studies have shown that when dietary habits are poor that they have been so for many years prior to pregnancy (3,5). And although these bad habits can be changed somewhat by counseling during pregnancy (25), the best approach to pregnancy would be good nutrition throughout the life cycle (20). Stearns states, "The best insurance for a healthy infant is a mother who is healthy and well nourished throughout her entire life, as well as during the period of pregnancy itself (26)."

Concerning salt restriction during the last trimester of pregnancy, the Committee of Maternal Nutrition of the National Research Council has stated that many doctors routinely limit salt intake to avoid edema formation. They also prescribe diuretics for the same reason. Studies by Pike (27,28), however, indicated that sodium depletion may produce deleterious effects in pregnant rats. These included general lethargy and debility, and significant reductions in plasma and tissue sodium. Since sodium is essential for the expansion of blood and tissue volume during pregnancy, a sodium restriction places undue stress on the mechanism which regulates sodium reabsorption. The mechanism could handle a sodium restriction alone or the increased needs of pregnancy alone, but the stress of both exceed the adjustment capacity of the mechanism. Although these studies were done on rats, they question the widespread use of sodium restriction in pregnancy. The Committee on Maternal Nutrition of the

National Research Council also states that the routine restriction of salt is not helpful in the prevention of preeclampsia and may be dangerous (1).

2. How much actual knowledge do the women have regarding aspects of nutrition which are important to their pregnancies?

The subjects in the study scored poorly on the nutrition quiz. The average score was 42 out of a possible 100 percent. The women answered more correctly on several questions, perhaps because of more exposure to those topics.

The questions which the women seemed more familiar with were those dealing with iron and protein containing foods and good sources of Vitamin C. In relation to the protein question, the women were not aware that dried beans were a good protein source. This information would be helpful to some patients, especially to those on restricted budgets.

Although the women did well in recognizing most of the iron containing foods, they incorrectly thought that milk and cheese were good sources. This might be due again to the advertising of milk as a complete food, which implies that it contains all necessary nutrients.

Approximately a third of the women knew the best amount of weight to gain during pregnancy. Since weight gain is still a somewhat controversial subject among doctors, the women's answers might be a reflection of what they had been told by their doctors. Most of the women answered that the

majority of the weight gain should come in the last trimester. They apparently did not realize that there should be a smooth weight increase occurring during the last six months of pregnancy. However, the wording of the question could have confused them, since it was asked as when should most of the weight gain occur. They could have based their answer on the way in which they had gained weight during their own pregnancy.

The amount of milk which pregnant women should drink daily and another good source of calcium were known by only half of the women. The use of overlapping numbers in the question might have confused them, since they frequently chose two to three and four to five cups. Also, individual differences as far as milk tolerance might also be reflected. Several of the subjects mentioned that they had cramps in their legs which the doctors had attributed to either too much or too little calcium, so this would also have affected their answers.

Overall, the women seemed to have little knowledge concerning foods which were important to their diets, not only during pregnancy, but at other times as well. However, since the quiz was not pretested, the type of question or the items which were selected could be at fault. Also, the women could be eating a well-balanced diet without being aware of the food sources of vitamins and minerals.

3. What are some of the attitudes of obstetricians regarding nutrition and nutrition education during pregnancy?

Five obstetricians answered and returned questionnaires pertaining to the study. Several of the questionnaire items dealt with attitudes of the physicians concerning nutrition and education during pregnancy.

The doctors were asked to rank five items in terms of their importance to pregnancy. Two of the five rated nutrition as most important and two rated it second after prenatal examinations begun early in pregnancy. Apparently the obstetricians in this study do recognize the importance of good nutrition during pregnancy. However, there may have been other items which they would have considered to be more important if they had been included.

Two of the five obstetricians did not think that women who had already had a child needed any additional nutritional counseling. Donabedian's study of prenatal care (22) indicated that inadequate nutritional prenatal care is very prevalent among women who have borne several children. This is probably one area in which physicians or nutritionists need to do additional counseling.

When asked if the obstetrician should be the individual who gives nutrition education to patients, three of the doctors answered yes, one answered no, and one responded sometimes. Thus, some of the doctors do feel that they should be involved in teaching their patients about nutrition, but they also would rely on others to supplement their information.

4. What kind and how much nutrition information are the women receiving from their obstetricians and from other sources?

The women indicated that they had received both written and verbal information from their obstetricians. The verbal information usually occurred in early pregnancy and involved foods which the doctors advised the women to include in or delete from their diets. Three of the doctors advised that snack foods of limited nutritional value such as candy, sweets, soda pop, and fritos, should be deleted. This advice is sound, since it is difficult for a pregnant woman to get all the necessary nutrients unless she chooses her foods carefully (23). One doctor advised that white vegetables should be avoided. He was probably referring to potatoes which many people think are "fattening," or perhaps he might also have been referring to such vegetables as onions or cauliflower which are gas forming.

It is interesting to note that almost all of the five doctors responding to the questionnaire recommended including foods from the meat, vegetable and fruit, and milk and dairy products groups. Only one, however, included the bread and cereal group. Although no doctor mentioned telling a patient to avoid breads, several women said that they had been told this. Only one of the thirty women indicated that a doctor had advised including a food from the bread and cereal group, and this food was rice.

Sources of nutrition information during pregnancy cited most often were books and pamphlets, with doctors next. Only 56 percent of the women said that the information they received from the sources had caused them to improve their eating habits. Perhaps if the women had received their information from an interested professional person, such as a doctor or nutritionist, more of them would have improved their habits.

Only four of the thirty women had received information concerning nutritional needs during lactation. Seventeen were planning to breast-feed their child. The doctors may have been waiting until the last month of pregnancy to discuss this with their patients, since all said that they did so.

Overall, the information indicated that in this study, very little time was devoted to nutrition education by the obstetricians. Most of the information which was given to the women was in terms of foods to eat or to avoid, and this information did not seem to outline a well-balanced diet due to the almost total exclusion of the bread and cereal group. Since the women said that reading materials had been very helpful to them, reading lists of acceptable articles might be an excellent addition to the information which is given out by the obstetricians. One of the offices utilized in this study had a small library of paperback books pertaining to many aspects of pregnancy which the women were allowed to

check out. This is another good way to get information to those who are interested.

The subjects in this particular study probably did not receive adequate information concerning nutrition in either quality or quantity. The obstetricians may need to devote more thought and time to teaching their patients about basic nutrition. If they are deficient in the training or time necessary to teach the subject, they should consider hiring nutritionists. By doing this, they may be helping to assure that their patients have healthy offspring.

CHAPTER VI

SUMMARY AND RECOMMENDATIONS

Summary

Obstetrical patients in first pregnancies who were patients of seven obstetricians in two group practices in Greensboro, North Carolina, were interviewed concerning nutrition education which they had received during their pregnancies from their obstetricians and other sources. They also completed an attitude scale and a quiz dealing with aspects of maternal nutrition. The obstetricians of the women answered a questionnaire to determine their practices in regard to nutrition education and their attitudes about nutrition during pregnancy.

Results showed that 56 percent of the women felt that the nutrition education they had received had caused them to improve their eating habits. The doctor was only one of the sources of nutrition information named by the women. Books, pamphlets, friends, and relatives were also said to be helpful.

The attitude scales showed that the women recognized some of the "old wives' tales" which are still circulating. Eighty-nine to 100 percent agreed with concepts which are important to good nutrition during pregnancy, such as the

importance of thinking about and planning the diet and the importance of milk in the diet. Only 60 percent agreed with the statement that pregnant women have a good knowledge of nutrition, which might indicate that they believe that their own knowledge was poor.

The women scored very poorly on the nutrition quiz. The only questions on which they did well dealt with protein and Vitamin C sources. They were confused about the amount of weight which should be gained during pregnancy and about when most of the weight gain should occur. Approximately half knew the correct amount of milk to drink daily and about other sources of calcium besides milk.

Five of the seven obstetricians responded to the questionnaire which was sent out. They indicated that most of their nutrition counseling took place on the initial visit during pregnancy unless some special problem occurred. They gave both written and oral information to their patients concerning nutrition, and also advised them on foods to include in and to delete from their diets. They also indicated that they gave instruction about nutritional preparation for lactation, but not at what time or in what form this took place. Three of the respondents felt that no additional nutrition counseling was needed for a woman who had already had one child.

Recommendations

The present study dealt with ascertaining the type and amount of nutrition education which primigravidas received from their obstetricians, the attitudes of the women and to some degree of the obstetricians concerning nutrition during pregnancy, and determining the knowledge of the women concerning some aspects of maternal nutrition. Results showed that most of the women had no questions regarding nutrition, however, the scores on the nutrition quiz and the fact that 60 percent of the women disagreed that most pregnant women have a good knowledge of nutrition seem to raise questions about their opinion.

Further studies are needed to determine how much information concerning nutrition the women are actually receiving during pregnancy and if they are retaining what they have received. It would also be of value to find out if the knowledge about nutrition which women possess at the end of pregnancy was learned during pregnancy or was known prior to pregnancy.

The information which the obstetricians present to their patients was only described briefly in this study. A more detailed descriptive study could indicate areas in which the doctors need to give more adequate information, and might show areas in which the doctors are deficient about nutrition.

Since the women in the study had differing ideas about the best kind of nutritional information to receive, a

comparison could be made of different groups of women who received different types of nutrition information to see which type was most helpful. Also a comparison could be made of the information given to multigravidas as opposed to primigravidas. The multigravidas could also be tested to see if they had greater knowledge on entering pregnancy than primigravidas.

The women in the study were also uncertain about some of their attitudes, and they scored poorly on some questions concerning nutrition. Future education programs utilized by obstetricians, or preferably nutritionists, should include such topics as: correct amount of weight gain and when it should occur; sodium intake during pregnancy; and important vitamins and their sources. Basic information on normal nutrition and meal planning might also be very helpful to the women.

Nutrition education efforts during pregnancy need to be increased. Obstetricians should be encouraged to ask for dietary histories from their patients to determine any problems of long standing or possibly to ascertain problems which could occur during pregnancy.

The diets of the patients should be evaluated for nutritional adequacy. Any good features of the diet should be praised and recommendations should be made regarding poor habits. Following the birth of the child, the importance of nutrition can continue to be emphasized as the baby is followed by a physician.

Private obstetricians should consider employing nutritionists or dietitians to counsel patients, since the demands of time almost require the use of additional personnel to assist the physician. Perhaps several doctors or groups of doctors might employ one dietitian for the sole purpose of counseling patients with special problems. The need for nutrition professionals in this area should continue to increase as more doctors and other health professionals become more aware of the importance of nutrition to pregnancy.

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- a. First three months
- b. Second three months
- c. Last three months
- d. First six months
- e. Last six months

Liver, meat, and eggs are excellent sources of iron. Other foods vary in their iron content with some being better sources than others. Which of the following foods are good sources? (Circle all that apply.)

- a. milk and cheese
- b. enriched breads and cereals
- c. raisins, grapes, berries
- d. potatoes, squash, corn
- e. pineapple, oranges, bananas
- f. spinach, mustard greens

4. Approximately how many cups of milk should a pregnant woman consume daily?

- a. 1-2 cups
- b. 3-4 cups
- c. 2-3 cups
- d. 4-5 cups

5. In addition to milk, which of the following are good sources of calcium? (Circle all that apply.)

- a. fruits
- b. green, leafy vegetables
- c. fats
- d. enriched breads and cereals

APPENDIX A

NUTRITION KNOWLEDGE QUIZ

Multiple Choice Directions: Please circle the letter in each question which corresponds to the correct answer.

1. The best amount of weight to gain during pregnancy is:
 - a. 10-15 pounds
 - b. 15-20 pounds
 - c. 20-25 pounds
 - d. 25-30 pounds
2. Most of this weight gain should occur during:
 - a. first three months
 - b. second three months
 - c. last three months
 - d. first six months
 - e. last six months
3. Liver, meat, and eggs are excellent sources of iron. Other foods vary in their iron content with some being better sources than others. Which of the following foods are not good sources? (Circle all that apply.)
 - a. milk and cheese
 - b. enriched breads and cereals
 - c. raisins, prunes, berries
 - d. potatoes, squash, corn
 - e. pineapple, oranges, bananas
 - f. spinach, mustard greens
4. Approximately how many cups of milk should a pregnant woman consume daily?
 - a. 1-2 cups
 - b. 2-3 cups
 - c. 3-4 cups
 - d. 4-5 cups
5. In addition to milk, which of the following are good sources of calcium? (Circle all that apply.)
 - a. fruits
 - b. green, leafy vegetables
 - c. fats
 - d. enriched breads and cereals

6. Protein is a nutrient which is essential for growth. Which of the following are good protein sources? (Circle all that apply.)

- | | |
|----------------|------------------|
| a. bacon | e. milk |
| b. beef | f. yellow squash |
| c. salt pork | g. apples |
| d. dried beans | h. rice |

Matching directions: Match the vitamin on the right with the food group on the left which is its best source.

- | | |
|---|--|
| ___ 7. beef, pork, whole-grain cereals, liver, nuts | a. Vitamin A |
| ___ 8. fortified milk, sunlight, fish liver oils | b. Vitamin B ₁ (Thiamin) |
| ___ 9. liver, eggs, butter, cheese, carrots, broccoli | c. Vitamin B ₂ (Riboflavin) |
| ___ 10. citrus fruits, tomatoes, potatoes, peppers, spinach | d. Vitamin C |
| | e. Vitamin D |

Directions: For each group of foods listed below, check the one with the highest caloric content.

11. ___ $\frac{1}{2}$ cup cooked tomatoes (no seasoning)
 ___ $\frac{1}{2}$ cup cooked prunes (no seasoning)
 ___ $\frac{1}{2}$ cup mashed potatoes (no seasoning)
12. ___ 3 ounces baked chicken
 ___ one hotdog
 ___ 3 ounces roast beef (fat and lean)

APPENDIX B

WOMEN'S ATTITUDE SCALE

Directions: Circle the letter that best describes your feelings about each statement. There are no right or wrong answers, so just respond quickly and honestly. The possible responses are:

SA strongly agree
 A agree
 U uncertain
 D disagree
 SD strongly disagree

- | | | | | | |
|----|---|---|---|----|---|
| SA | A | U | D | SD | 1. The amount of weight a woman gains during pregnancy is not important. |
| SA | A | U | D | AD | 2. When a woman is pregnant, she must eat twice as much as she normally would because she is "eating for two." |
| SA | A | U | D | SD | 3. As long as a pregnant woman takes vitamins everyday, it doesn't really matter what foods she eats. |
| SA | A | U | D | SD | 4. A woman will act instinctively during pregnancy to eat the foods she needs. |
| SA | A | U | D | SD | 5. It is not important for a pregnant woman to drink a lot of milk unless she is planning to breast feed her child. |
| SA | A | U | D | SD | 6. A pregnant woman will usually be more concerned about her eating habits than a non-pregnant woman. |
| SA | A | U | D | SD | 7. A woman's food habits prior to pregnancy can influence the development of her child. |
| SA | A | U | D | SD | 8. During pregnancy, a woman has enough to think about without worrying about the food she eats. |
| SA | A | U | D | SD | 9. Most pregnant women have a good knowledge of nutrition. |
| SA | A | U | D | SD | 10. Pregnant women usually practice good eating habits. |

- SA A U D SD 11. Cravings for food during pregnancy are the body's way of telling a woman that she is deficient in some nutrient.
- SA A U D SD 12. The best type of nutrition information to receive during pregnancy is lists of foods to eat and foods to avoid.
- SA A U D SD 13. Memorizing the nutrient content of various foods is a needless exercise.
- SA A U D SD 14. It is easy to obtain accurate nutrition information during pregnancy.
- SA A U D SD 15. Salt should be avoided during the last three months of pregnancy.

APPENDIX C

INTERVIEW SCHEDULE

1. Since becoming pregnant, has your doctor or any member of his staff questioned you about your eating habits?
____yes ____no

2. Have you received from your obstetrician or his staff any instruction in nutrition? ____yes ____no

If yes, in what form? ____verbal ____written ____other

Were you instructed to include certain foods in your diet? ____yes ____no If yes, please name them.

Were you instructed to avoid certain foods?
____yes ____no If yes, please name them.

3. Did you receive nutrition education during each office visit or primarily during one visit?

Was most of it given in early pregnancy or mostly in the last months?

4. What was your primary source of nutrition information prior to pregnancy?

5. Have you read any printed material about nutrition?
____yes ____no If so, what was the source of the material?

Was it helpful to you? ____yes ____no In what way?

6. Have you discussed nutrition with anyone other than your obstetrician? ____yes ____no If yes, who?

7. Overall, what sources of nutrition information have been most helpful to you during your pregnancy?

8. Do you have any questions about nutrition which have not been answered? ____yes ____no What are they?

9. Do you feel that the information you have received has changed your eating habits in any way?
____yes ____no If yes, did it improve or worsen your habits?

If no change, why not?

10. Has your obstetrician or a staff member discussed how to prepare yourself nutritionally for lactation?
 ___yes ___no When was this done? _____

1. Do you or your staff give any routine dietary information to all pregnant patients? ___yes ___no If yes, please describe content briefly.

2. Do you request a diet history for your pregnant patients? ___yes ___no If so, please attach form or describe.

Do you carry out any tests to determine nutritional status? ___yes ___no If yes, what?

3. Do you routinely distribute printed material about nutrition? ___yes ___no If so, please attach or describe.

4. Do you routinely prescribe vitamin or mineral supplements for your pregnant patients? ___yes ___no Please indicate the approximate percentage of patients who receive each of the following.

___Multivitamins ___Calcium salts
 ___Vitamin A & Iron ___None
 ___Iron ___Other (please name)

5. Are there any foods which you encourage your patients to include in their diets during pregnancy? ___yes ___no If yes, please list several.

APPENDIX D

QUESTIONNAIRE FOR OBSTETRICIANS

1. Do you or your staff give any routine dietary information to all pregnant patients? ☐yes ☐no If yes, please describe content briefly.

2. Do you request a diet history for your pregnant patients? ☐yes ☐no If so, please attach form or describe.

Do you carry out any tests to determine nutritional status? ☐yes ☐no If yes, what?

3. Do you routinely distribute printed material about nutrition? ☐yes ☐no If so, please attach or describe.

4. Do you routinely prescribe vitamin or mineral supplements for your pregnant patients? ☐yes ☐no
Please indicate the approximate percentage of patients who receive each of the following.

☐Multivitamins

☐Calcium Salts

☐Vitamins & Iron

☐None

☐Iron

☐Other (please name)

5. Are there any foods which you encourage your patients to include in their diets during pregnancy? ☐yes
☐no If yes, please list several.

6. Are there any foods which you encourage your patients to exclude from their diets during pregnancy? ☐ yes ☐ no If yes, please list several.
7. Do you change the type of nutrition education you give during different trimesters of pregnancy?
☐ yes ☐ no If yes, what do you emphasize the most during:
- 1st trimester:
- 2nd trimester:
- 3rd trimester:
8. When do you give nutrition education?
- ☐ during each prenatal visit
- ☐ mostly on the initial visit
- ☐ other (please describe)
9. Do you ever discuss nutritional preparation for lactation during pregnancy? ☐ yes ☐ no
10. Do you feel that a woman who already has had a child needs additional nutrition counseling? ☐ yes ☐ no
11. Rank the following in order according to your feelings about their importance during pregnancy, with one (1) being the most important.
- ☐ planned exercise program
- ☐ adequate rest
- ☐ proper nutrition
- ☐ appropriate weight gain
- ☐ prenatal examinations begun early in pregnancy
12. Considering the many demands on an obstetrician's time, do you feel that the obstetrician should give nutrition education to his patients? ☐ yes ☐ no ☐ sometimes
- In cases where the obstetrician does not give it, who should?

APPENDIX E
ATTITUDE SCALE DATA FOR GROUP I

Item	SA		A		U		D		SD		NA	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1. Pregnancy weight gain*	2	10	1	5	2	10	7	35	8	40	0	0
2. Eat for two	0	0	0	0	2	10	9	45	9	45	0	0
3. Vitamin usage*	0	0	0	0	0	0	11	55	9	45	0	0
4. Instinctive eating	0	0	3	15	1	5	12	60	3	15	1	5
5. Milk consumed*	0	0	0	0	1	5	11	55	8	40	0	0
6. Concern with eating	5	25	12	60	2	10	1	5	0	0	0	0
7. Prior food habits	2	10	7	35	7	35	2	10	2	10	0	0

* Negative Statement
SA Strongly Agree
A Agree
U Uncertain
D Disagree
SD Strongly Disagree

APPENDIX E--Continued

Item	SA		A		U		D		SD		NA	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
8. Worry about food*	0	0	2	10	1	5	9	45	8	40	0	0
9. Nutrition knowledge	1	5	3	15	1	5	12	60	3	15	0	0
10. Practice good habits	0	0	6	30	5	25	9	45	0	0	0	0
11. Cravings for food	0	0	5	25	2	10	9	45	4	20	0	0
12. Foods to eat or avoid	1	5	12	60	2	10	5	25	0	0	0	0
13. Learning nutrient content*	0	0	0	0	4	20	13	65	1	5	2	10
14. Obtain nutrition knowledge	3	15	12	60	1	5	2	10	0	0	2	10
15. Avoid salt	2	10	7	35	5	25	4	20	00	0	2	10

* Negative Statement

APPENDIX F

ATTITUDE SCALE DATA FOR GROUP II

Item	SA		A		U		D		SD		NA	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1. Pregnancy weight gain*	1	10	0	0	0	0	3	30	6	60	0	0
2. Eat for two	0	0	0	0	1	10	4	40	5	50	0	0
3. Vitamin usage*	0	0	0	0	0	0	4	40	6	60	0	0
4. Instinctive eating	0	0	4	40	3	30	2	20	0	0	1	10
5. Milk consumed*	0	0	0	0	1	10	7	70	2	20	0	0
6. Concern with eating	1	10	6	60	1	10	1	10	1	10	0	0
7. Prior food habits	0	0	5	50	2	20	2	20	0	0	1	10
* Negative Statement												
SA Strongly Agree												
A Agree												
U Uncertain												
D Disagree												
SD Strongly Disagree												

APPENDIX F--Continued

Item	SA		A		U		D		SD		NA	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
8. Worry about food*	0	0	0	0	0	0	7	70	3	30	0	0
9. Nutrition knowledge	0	0	2	20	5	50	2	20	1	10	0	0
10. Practice good habits	1	10	4	40	1	10	3	30	1	10	0	0
11. Cravings for food	0	0	2	20	3	30	4	40	1	10	0	0
12. Foods to eat or avoid	1	10	7	70	1	10	1	10	0	0	0	0
13. Learning nutrient content*	1	10	2	20	0	0	6	60	1	10	0	0
14. Obtain nutrition knowledge	0	0	6	60	0	0	4	40	0	0	0	0
15. Avoid salt	1	10	6	60	1	10	2	20	0	0	0	0

* Negative Statement